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Can the Adjustment of Average Personal & Company Income Tax Rates Sustain Government Revenue and Tax Payers' Welfare in Papua New Guinea?

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Acknowledgement

- *Bank of Papua New Guinea (BPNG)*
- *Dr Ole Rummel, SEACEN Centre of Central Banks, Malaysia*
- *University of Papua New Guinea (UPNG) and Australia National University (ANU) Master's Program Facilitating Team*
- *Internal Revenue Commission (IRC)*

Disclaimer

"Any policy considerations, strategies and views presented including the content does not represent the views of the Board and Management of the Bank of PNG and the University of Papua New Guinea including my direct associates in relation to the research papers"

Presentation Outline

- Research Papers
- Research Questions & Objectives
- Overview of Taxation in PNG
- Screening Tests & Assurance for the Research Papers
- Models Specification
- Results Analysis & Solution
- Conclusion

Research Papers

The presentation is a combination of these two (2) research papers:

1. **The Dynamics Effects of Average Personal and Company Income Tax Rates Adjustments in Papua New Guinea|** Structural Vector Autoregressive (SVAR) Model| @ BPNG (2016-2020)
2. **The Short-run and Long-run Parameters of the Key Components of Government Revenue in Papua New Guinea|** Autoregressive Distributed Lag (ARDL) Model| Master's Degree Major Research Paper @ UPNG (2019-2020)

Research Questions & Objectives

- *Can the reduction of average personal income tax rate sustain government revenue and improve tax payers income?*

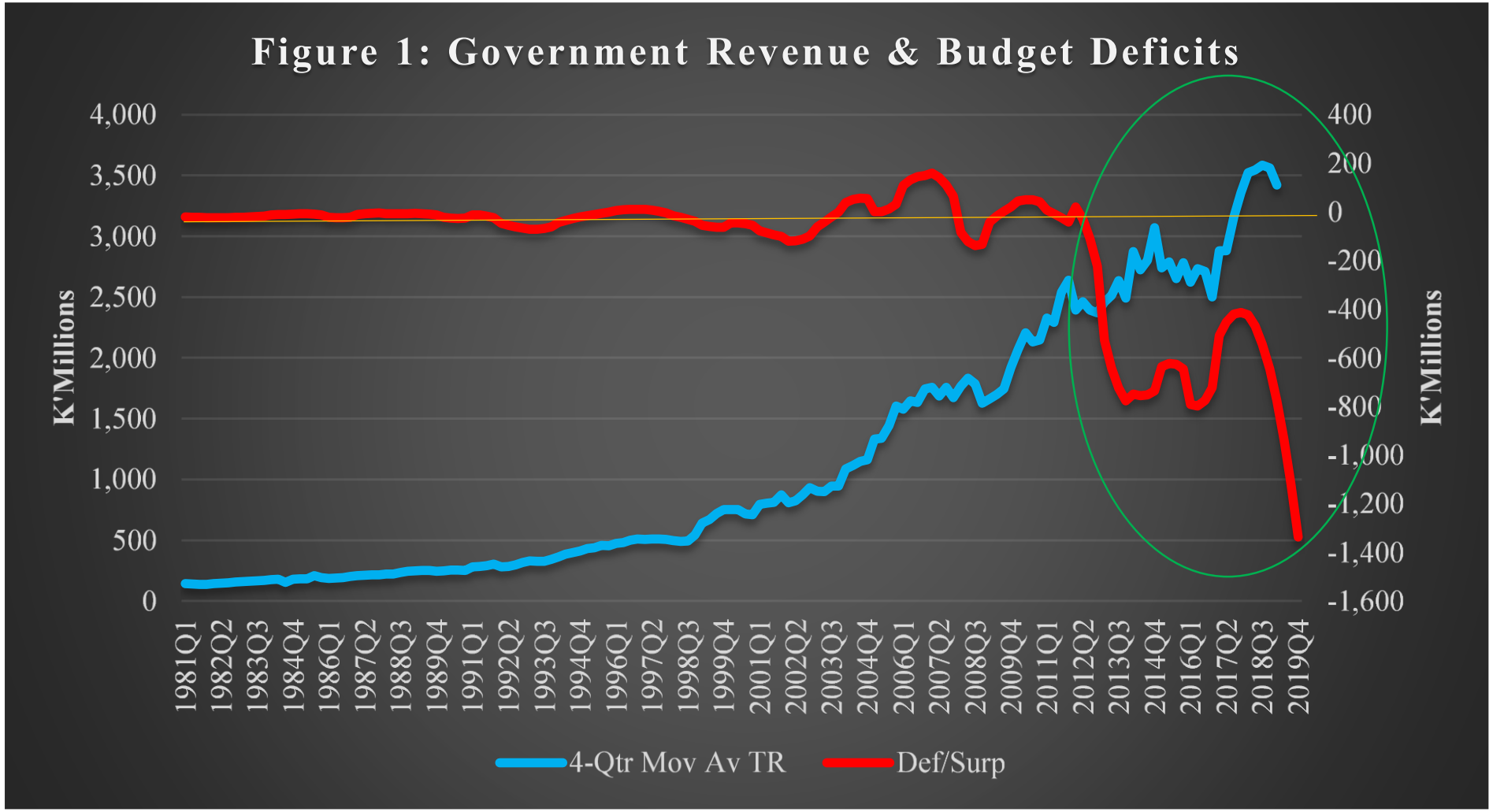
- *Can the adjustment of average company income tax rate sustain Government revenue and sustain company profits where reduction of average personal income tax rate fall short?*

- ***Objectives*:**
  - *Achieve a Win-win Outcome*
  - *Sustain or Improve Government Revenue*
  - *Improve Personal Income Tax Payers Income*
  - *Sustain Company Profits*

Overview of Taxation in PNG

- Taxation regime in PNG is empowered by the *Income Tax Act 1959*. Also, supported by the *GST Act 2003* and other related Laws and Statutes.
- Government administers its taxation functions of policy, management and collection through its key agencies of Treasury Department and Internal Revenue Commission.
- Government consistently depends on revenue from taxes to fund the National Budget in order to deliver basic goods and services, and capital investment projects.

Government Revenue & Budget Deficits



Data Source: Bank of PNG & National Budget Volumes

A| Fiscal Deficits

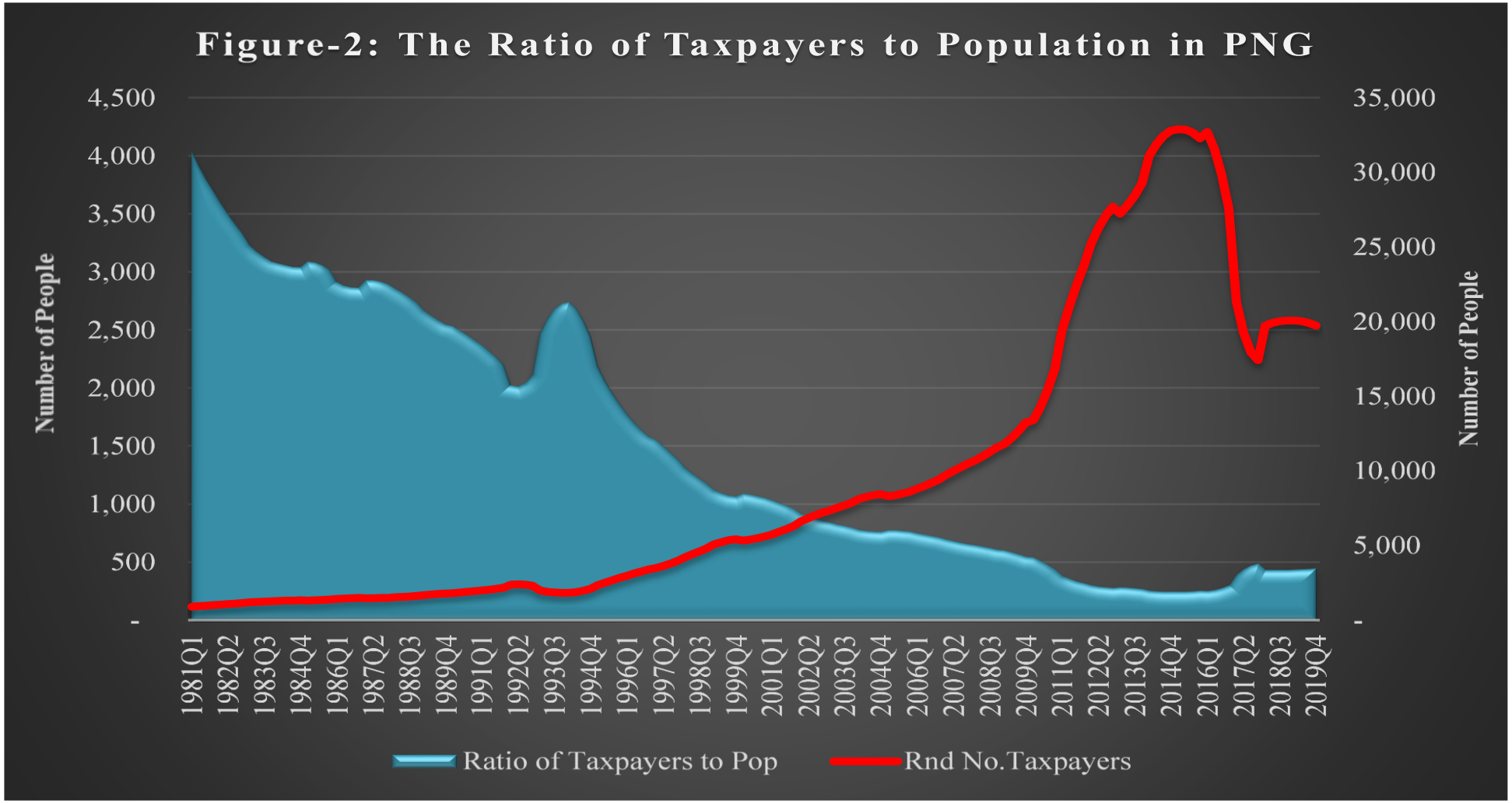
- Deficit budget stimulates growth but relies heavily on tax revenue, borrowed funds and debt issuances.
- Government heavy dependence on taxation, continuous deficits, limited investment in capital projects via SOEs with the appetite for more borrowing. This will force the economy into a scenario best described by the **Ricardian Equivalence Theorem**.
- The theory argues that Government will further increase tax rates to meet the budgeted revenue and future higher debt repayments with interest.

B| Fiscal Deficits

- GoPNG fiscal deficit trend continues as the country's debt burden widens from around K700 million in 2013 to K1.3 billion at the end of 2019.

- The accumulative debt position stands at K33.7 billion at the end of December 2019 (i.e. 45.5% of Deb-to- GDP (real) ratio). And K40.2 billion at the end of December 2020 (i.e. 56.1% of Deb-to- GDP (real) ratio).The debt includes domestic, foreign and other debts.

A| Tax Incidence or Burden in PNG



Data Source: Bank of PNG, IRC & World Bank

B| Tax Incidence or Burden in PNG

- In 1981, an average group of 951 personal income taxpayers supported an average population of 3.7 million people with their income tax contribution. The distribution ratio is 1 taxpayer is to 4043 people in the March quarter of 1981.
- The average number of personal income taxpayers reached its peak in 2014, with around 33 thousand personal income taxpayers supporting the population of 8.1 million people. That is 1 taxpayer to 244 people.
- Example, an active taxpayer earns an average of K117,000 (gross) annually (sample 2008 to 2021), pays around K34,000 in tax (around 29% incidence) and gets a 3-dependent rebate relief of K1,050 annually (3.1% relief).

Main Literatures of the Research Papers

- Mertens and Ravn (2013) – Study on…. The Dynamic Effects of Personal and Corporate Income Tax Changes in the United States
- Sims (1980) – Study of the VAR Model
- Dladla & Khobai (2018) – The Study on…The impact of Taxation on Economic Growth in South Africa.
- Pesaran et al. (1996), Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001) – Study of the ARDL Model

Screening Tests & Assurance for the Research Papers

- Variables are treated for random/time variations (2012 X-12 USA Bureau of Census technique) and undergo diagnostic test include unit roots or stationarity tests.
- Models pass through serial correlation test, normality test, lag-length selections and include dummy variables as well, stability test and other relevant tests.
- Paper-1 via Bank of PNG was extensively reviewed by Dr Ole Jens Rummel, Director of SEACEN Centre, Malaysia.
- Paper-2 via UPNG-ANU Master's Program was extensively reviewed and marked by an independent marker & economist at ANU and awarded Higher Distinction.

Models Specification| SVAR & ARDL

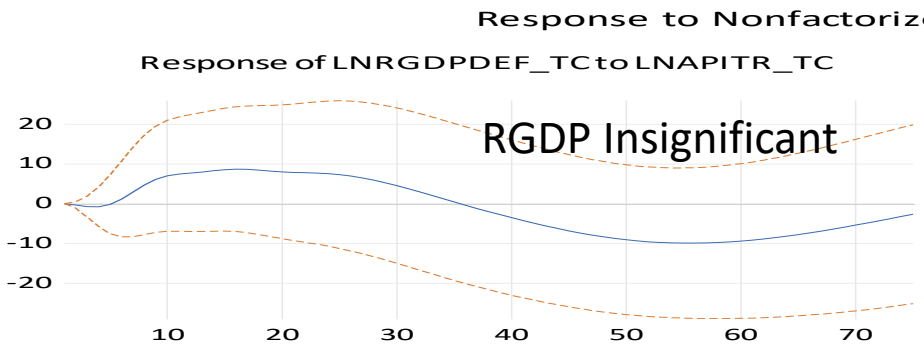
1. SVAR model

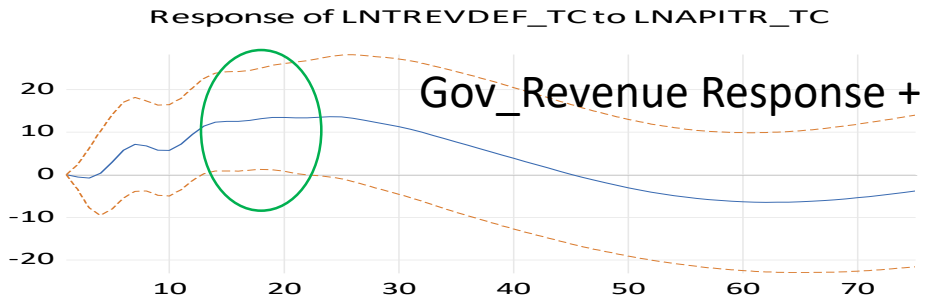
- $AY_t = \sum_{j=1}^{p} \vartheta_j Y_{t-j} + Bu_t$
- $Y_t = [ln(APITR_t), ln(PITB_t), ln(GST_t), ln(GR_t), ln(RGDP_t)]$
- $Y_t = [ln(ACITR_t), l\,n(CITB_t), ln(COP_t), ln(GST_t), ln(TR_t), ln(RGDP_t)]$

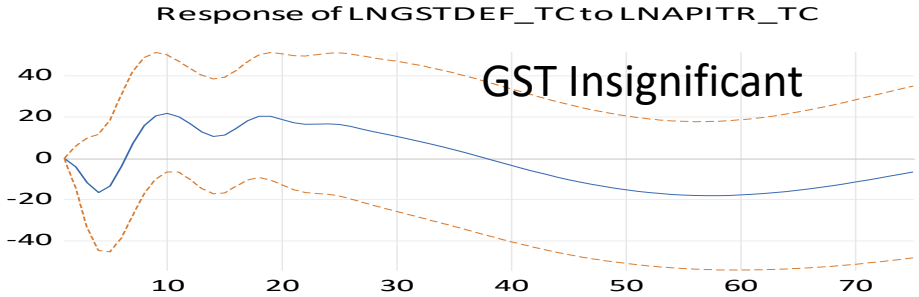
2. ARDL model

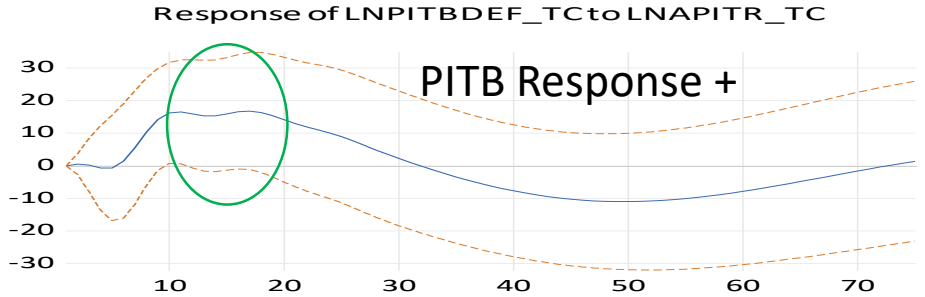
- $\ln G\Re_t = \alpha_0 + \beta_1 \ln Д P_t + \beta_2 \ln Ѧ C_t + \beta_3 \ln ƀ_t + \beta_4 \ln €_t + \beta_5 \ln ₵_t + Ø\delta_t + \varepsilon_t$
- $\Delta \ln G\Re_t = -Ɛ_t + \sigma_0 + \sigma_1 \ln G\Re_{t-1} + \sigma_2 \ln Д P_{t-1} + \sigma_3 \ln Ѧ C_{t-1} + \sigma_4 \ln ƀ_{t-1} + \sigma_5 \ln €_{t-1} + \sigma_6 \ln ₵_{t-1} + \Sigma_{i=1}^{p_1} \varphi_1 \Delta \ln G\Re_{t-1} + \Sigma_{i=1}^{p_2} \varphi_2 \Delta \ln Д P_{t-1} + \Sigma_{i=1}^{p_3} \varphi_3 \Delta \ln Ѧ C_{t-1} + \Sigma_{i=1}^{p_4} \varphi_4 \Delta \ln ƀ_{t-1} + \Sigma_{i=1}^{p_5} \varphi_5 \Delta \ln €_{t-1} + \Sigma_{i=1}^{p_6} \varphi_6 \Delta \ln ₵_{t-1} + Ø\delta_t + \varepsilon_t$

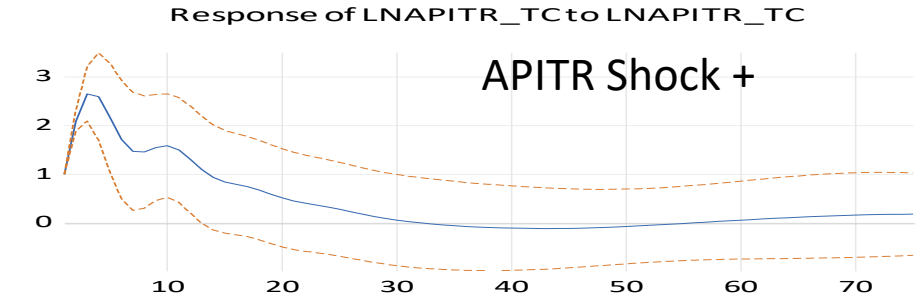
Ai| SVAR Model| APITR Shock



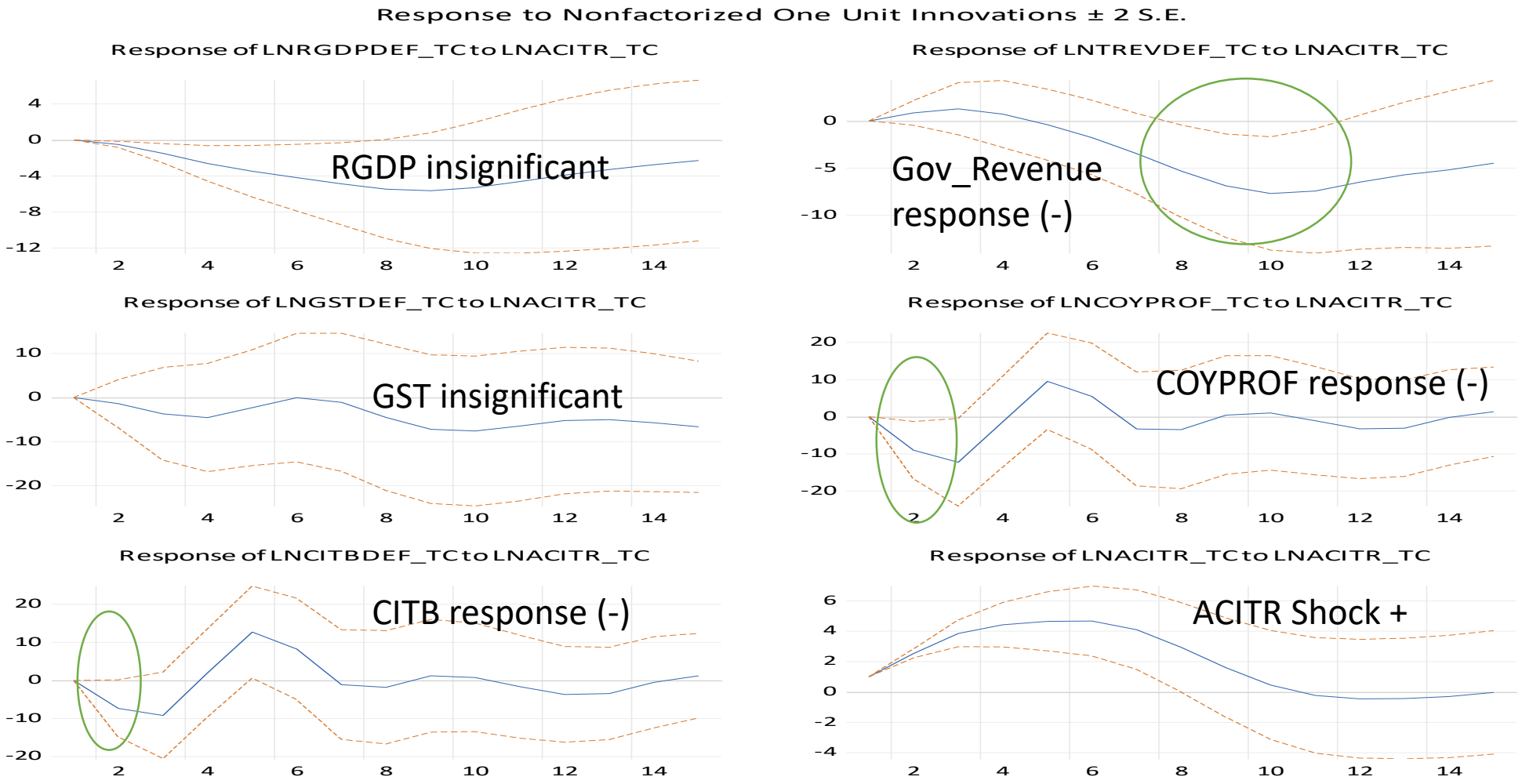








Aii| SVAR Model| ACITR Shock



B| SVAR Model| APITR Output

- This is the SVAR regression output:
- The APITR shock contemporaneously affect PITB at significant levels by period 11 or after 11-quarter period. A 1.0 percent cut (increase) in the APITR impacted the PITB to decline (increase) by 16.5 percent at the 11-quarter period.
- The APITR shock contemporaneously affect Government Revenue at significant levels by period 14 or after 14-quarter period. A 1.0 percent cut (increase) in the APITR impacted the Government Revenue to decline (increase) by 12.3 percent at the 14-quarter period.
- The APITR shock on does not affect GST and Real GDP at significant levels.
- PITB is a product of Personal Income (Hours worked X Hourly rate) and Number of PI Taxpayers. An increase in PI and number of taxpayers causes PITB to increase, hence, increase in PI Taxes (same as PITB x Tax Rate (38%) or APITR) and vice versa.
- A reduction in APITR directly causes PI Taxes contribution to Government Revenue to decline. On the other hand , taxpayers disposal income increase at the same magnitude.

A| ARDL Model Output| Short-run

Table-1: Short-run Results

Variable	Coefficient	t-Statistic	Probability
APITR	4.10	3.23	0.0020
ACITR	0.33	3.12	0.0028
PITB	-	-	-
CITB	-	-	-
GST	-0.08	-2.92	0.0049
Constant (unrestricted)	0.22	6.85	0.0000
R-squared	0.83		
Durbin-Watson	1.67		
ECT	-0.1366	-6.84	0.0000

Outcome Source: EViews-11 Output

A| ARDL Model Short-run Results

- The short-run results from the ARDL model shows that only APITR, ACITR and GST are significant. While the PITB and CITB have no relationship with Government revenue.
- A 1 percent change or increase (decline) in APITR causes Government revenue to increase (decline) by 4.1 percent.
- A 1 percent change or increase (decline) in ACITR causes Government revenue to increase (decline) by 0.33 percent.
- A 1 percent change or increase (decline) in GST causes Government revenue to decline (increase) by 0.08 percent, which is very minimal.

B| ARDL Model Output| Long-run

Table-2: Long-run Results

Variable	Coefficient	t-Statistic	Probability
APITR	0.22	0.12	0.91
ACITR	-0.20	-0.56	0.58
PITB	0.49	3.92	0.0002
CITB	0.07	0.77	0.44
GST	0.43	5.17	0.0000
Constant (unrestricted)	-	-	-

Outcome Source: EViews-11 Output

B| ARDL Model Long-run Results

- The Long-run results of the ARDL model.

- Both PITB and GST have a direct and significant relationship with Government Revenue in the long-run. However, APITR, ACITR and CITB relationships to Government Revenue are insignificant.

- A 1 percent change or increase (decline) in PITB causes Government revenue to increase (decline) by 0.49 percent. Or a 10 percent increase in PITB, causes Government Revenue to increase by 4.9%.

- A 1 percent change or increase (decline) in GST causes Government revenue to increase (decline) by 0.43 percent. Or a 10 percent increase in GST, causes Government Revenue to increase by 4.3%.

Results Analysis & Solutions

- A 10 percent reduction in PITB, reduces Government Revenue by 4.9 percent. PITB is an indicator of PI Taxes i.e. PITB x APITR. For instance, if APITR reduced by 10%, then PI Taxes will decline by 10%. However, disposal income increases by 10%. Most of taxpayers disposal income between 50% to 100% is usually spent on goods and services. Hence, will end-up in GST collection and it is a good proxy for disposal income.

- Therefore, a 10 percent increase in GST increases Government Revenue by 4.3 percent. The reduction in PI Taxes is offset by increase in GST collection that sustainably maintains Government Revenue, however, Government will fall short of 0.6 percent of its revenue. This imbalance can be met by increasing ACITR or GST rate or increase investments to fund this short-fall.

- Essentially, PI Taxes are transferred back to taxpayers as additional income for them to be spent directly to improve their standard of living before transiting as GST collection to fund the budget.

Conclusion

- Empirical evidence shows that Government can reduce APITR in Papua New Guinea. Even though it is a loss of Government revenue, it will recover through GST collection. Any further short-fall can be met by slightly increasing the ACITR and GST rate or increase investments to fill the gap.

End of Presentation

Thank you